

Claims

[c1] 1. A dual slope analog to digital converter, comprising:

- a first operational amplifier;
- an integrator;
- a comparator, whose positive input is coupled to the output of the integrator;
- a resistor coupling the output of the first operational amplifier and the first input of the integrator; and
- a first capacitor coupling the first input of the integrator and the negative input of the comparator,

wherein a plurality of couplings are controlled by a plurality of switches, comprising:

- a first coupling, controlled by a first set of switches, for optionally forming a negative feedback loop for the first operational amplifier;
- a second coupling, controlled by a second switch, for optionally forming connection between the negative input of the comparator and the positive terminal of the first operational amplifier, and
- a third coupling, controlled by a third switch, optionally forming connection of feedback loop from the output of the comparator to the positive terminal of the first operational amplifier.

[c2] 2.The dual slope analog to digital converter as recited in claim 1, wherein the integrator at least comprises: a second operational amplifier, having a positive input terminal that is coupled to an analog ground voltage; a second capacitor, being negatively feedback looped of the second operational amplifier.

[c3] 3.The dual slope analog to digital converter as recited in claim 1, wherein the couplings are controlled for a plurality of phases, comprising:
an offset cancellation phase, wherein the first coupling is on, the second coupling is on, and the third coupling is on;
an integration phase, wherein the first coupling is on via a first capacitor supplying a first voltage across which, the second coupling is on, and the third coupling is off;
a discharge phase, wherein the first coupling is on via the first capacitor supplying a second voltage across which, the second coupling is on, and the third coupling is off; and
a charge reset phase, wherein the first coupling is on, the second coupling is off, and the third coupling is on.

[c4] 4.The dual slope analog to digital converter as recited in claim 1, wherein the comparator comprises a third operational amplifier.

[c5] 5.A dual slope analog to digital converter, comprising:

- a first operational amplifier;
- a comparator, whose positive input is coupled to an analog ground;
- a first resistor, coupling a first pin an output of the first operational amplifier;
- a first capacitor, coupling negative input of the comparator and the first pin and
- a second capacitor, coupling the first pin and a ground, wherein a plurality of couplings are controlled by a plurality of switches, comprising:
 - a first coupling, controlled by a first set of switches, for optionally forming a negative feedback loop of the first operational amplifier,
 - a second coupling, controlled by a second switch, for optionally forming connection between positive input terminal of the first operational amplifier and negative input terminal of the comparator, and
 - a third coupling, controlled by a third switch, for optionally forming a negative feedback loop from the output of the comparator to the positive terminal of the first operational amplifier.

[c6] 6.The dual slope analog to digital converter as recited in claim 5, wherein the comparator comprises a second operational amplifier.

[c7] 7.The dual slope analog to digital converter as recited in claim 5, wherein the couplings are controlled for a plurality of phases, comprising:

an offset cancellation phase, wherein the first coupling is on, the second coupling is on, and the third coupling is on;

an integration phase, wherein the first coupling is on via a third capacitor supplying a first voltage across which, the second coupling is on, and the third coupling is off;

a discharge phase, wherein the first coupling is on via the third capacitor supplying a second voltage across which, the second coupling is on, and the third coupling is off; and

a charge reset phase, wherein the first coupling is on, the second coupling is off, and the third coupling is on.